| M PTO-1390<br>V. 5-93) | U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE | ATTORNEY'S DOCKET NUMBER<br>10191/874 |
|---|---|---|
| **TRANSMITTAL LETTER TO THE UNITED STATES<br>DESIGNATED/ELECTED OFFICE (DO/EO/US)<br>CONCERNING A FILING UNDER 35 U.S.C. 371** | | U.S. APPLICATION NO. (If known, see 37 CFR 1.5)<br>**09/180691** |

| INTERNATIONAL APPLICATION NO.<br>PCT/DE98/00473 | INTERNATIONAL FILING DATE<br>(18.02.98)<br>18 February 1998 | PRIORITY DATE CLAIMED:<br>(15.03.97)<br>15 March 1997 |
|---|---|---|

TITLE OF INVENTION
**METHOD AND RECEIVER FOR GEOGRAPHICAL SELECTION OF DIGITALLY CODED MESSAGES**

APPLICANT(S) FOR DO/EO/US
**KELL, Dietmar; and SCHMIDT, Heinrich**

Applicants herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. ☐  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. ☒  This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. ☐  A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒  A copy of the International Application as filed (35 U.S.C. 371(c)(2))

   a. ☐  is transmitted herewith (required only if not transmitted by the International Bureau).

   b. ☒  has been transmitted by the International Bureau.

   c. ☐  is not required, as the application was filed in the United States Receiving Office (RO/US)

6. ☒  A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☒  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))

   a. ☐  are transmitted herewith (required only if not transmitted by the International Bureau).

   b. ☐  have been transmitted by the International Bureau.

   c. ☐  have not been made; however, the time limit for making such amendments has NOT expired.

   d. ☒  have not been made and will not be made.

8. ☐  A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

9. ☒  An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (unsigned).

10. ☐  A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Items 11. to 16. below concern other document(s) or information included:**

11. ☒  An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. ☐  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. ☒  A **FIRST** preliminary amendment.

   ☐  A **SECOND** or **SUBSEQUENT** preliminary amendment.

14. ☐  A substitute specification.

15. ☐  A change of power of attorney and/or address letter.

16. ☒  Other items or information: International Search Report, and Form PCT/RO/101.

EXPRESS NO. EL 169611849US

| U.S. APPLICATION NO. if known, see 37 C F R 1 5 | INTERNATIONAL APPLICATION NO. PCT/DE98/00473 | ATTORNEY'S DOCKET NUMBER 10191/874 |
|---|---|---|

**17.** ☒ The following fees are submitted:

**Basic National Fee (37 CFR 1.492(a)(1)-(5)):**

Search Report has been prepared by the EPO or JPO .. . . . . . . . . . . $930.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) . $720.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))   . . . . . . . $790.00

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO . . . . . . . . . . . . . . . . . $1,070.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) .   . .   . . . . . . . . . . $98.00

|  | CALCULATIONS | PTO USE ONLY |
|---|---|---|
| **ENTER APPROPRIATE BASIC FEE AMOUNT =** | $ 930.00 | |
| Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1 492(e)). | $ | |

| Claims | Number Filed | Number Extra | Rate |  |  |
|---|---|---|---|---|---|
| Total Claims | 12 - 20 = | 0 | X $22.00 | $ 0 | |
| Independent Claims | 2 - 3 = | 0 | X $82.00 | $ 0 | |
| Multiple dependent claim(s) (if applicable) | | | + $270.00 | $ | |

| **TOTAL OF ABOVE CALCULATIONS =** | $ 930.00 | |
|---|---|---|
| Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1 9, 1.27, 1.28) | $ | |
| **SUBTOTAL =** | $ 930.00 | |
| Processing fee of $130 00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f))    + | $ | |
| **TOTAL NATIONAL FEE =** | $ 930.00 | |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31)  $40.00 per property   + | $ | |
| **TOTAL FEES ENCLOSED =** | $ 930 00 | |

| | Amount to be: | |
|---|---|---|
| | refunded | $ |
| | charged | $ |

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. _11-0600_ in the amount of $ 930.00 to cover the above fees  A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No __11-0600__. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Kenyon & Kenyon
One Broadway
New York, New York 10004

SIGNATURE *Richard L. Mayer*
*By* *Mary C. Wine*
*Reg No. 36333*

Richard L. Mayer, Reg No 22,490
NAME

*11/13/98*
DATE

38642

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)        :    Dietmar KELL et al.

Serial No.        :    To Be Assigned

Filed        :    Herewith

For        :    METHOD AND RECEIVER FOR GEOGRAPHICAL SELECTION OF DIGITALLY CODED MESSAGES

Examiner        :    To Be Assigned

Art Unit        :    To Be Assigned

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

SIR:

Kindly amend the above-identified application before examination and calculation of the filing fee as follows:

IN THE DRAWINGS:

Please amend the drawing submitted herewith, as indicated in red ink.

IN THE SPECIFICATION:

On page 1, before line 1, insert:
--FIELD OF THE INVENTION--.

On page 1, line 1, change "concerns" to --relates to--, and after "for" insert --a--.

On page 1, line 5, change "; and" to --. The present invention also relates to--.

On page 1, before line 8, insert
--BACKGROUND INFORMATION--.

On page 1, lines 21-22, delete "in the last few years--.

On page 3, before line 5, insert:
--SUMMARY OF THE INVENTION--.

On page 3, delete line 21, and insert:
--The method can be used--.

On page 3, line 30, delete "furthermore".

On page 4, line 33, change "is" to --can be--.

On page 5, lines 7-8, delete "before it".

On page 5, line 9, delete "however,".

On page 5, line 13, change "A development of the" to
--The--.

On page 5, line 14, change "consists in the fact" to
--provides--.

On page 5, line 19, change "development" to
--embodiment--.

On page 5, line 22, change "is preferably" to --can
be--.

On page 5, line 28, change "Lastly, if" to --If--.

On page 5, line 29, change "an advantageous" to
--another--.

On page 5, delete line 30, and insert:
--embodiment of the present invention is provided for--.

On page 6, line 7, change "the development" to
--another embodiment--.

On page 6, line 8, change "be embodied in such a
way" to --provide--.

2

On page 6, line 24, change "a development" to --an exemplary embodiment--.

On page 6, delete lines 31-35.

On page 7, delete lines 1-20, and insert:
--BRIEF DESCRIPTION OF THE DRAWINGS
Figure 1 shows a block diagram of a receiver according to the present invention.

Figure 2 shows a schematic illustration of data blocks which contain selection data.

Figure 3 shows a schematic illustration of a vehicle's journey through several transmission regions and TMC regions.

Figure 4 shows a flow chart for analyzing received selection data.

Figure 5 shows a flow chart for selecting messages based on the received selection data.

DETAILED DESCRIPTION
The receiver shown in Figure 1 has--.

On page 7, lien 21, delete "se,".

On page 7, line 34, change "made up" to --composed--.

On page 8, line 1, change "; in the" to --.  In an--.

On page 9, line 2, change "B" to --E--.

On page 12, delete the first line, and insert:
--What Is Claimed Is:--.

3

IN THE ABSTRACT:

Delete line 1, and insert:

-- ABSTRACT OF THE DISCLOSURE--.

IN THE CLAIMS:

Please cancel claims 1-12, without prejudice.

Please add new claims 13-24, as follows:

--13.   (New) A method for geographically selecting digitally
coded messages which are emitted from a plurality of
transmitters, the digitally coded messages including location
data, the method comprising the steps of:

transmitting, via the transmitters, selection data
indicative of a respective transmission region of at least one
of the transmitters; and

comparing, in receivers, the location data to the
selection data for selecting the digitally coded messages, the
selection data being dependent on a respective position of at
least one of the receivers.

14.   (New) The method according to claim 13, wherein the
selection data includes location codes of particular areas,
the particular areas being defined for coding and decoding of
the digitally coded messages and being positioned at least
partially in the respective transmission region of the at
least one of the transmitters.

15.   (New) The method according to claim 13, wherein the
selection data includes coordinates and a radius of the
respective transmission region of the at least one of the
transmitters.

16.   (New) The method according to claim 13, wherein a
particular group of the transmitters emits identical data to
the selection data.

4

17.   (New) The method according to claim 14, further
comprising the step of:

transmitting reference data for the selection data,
wherein the reference data and the selection data are
transmitted in system messages of a data stream which includes
the digitally coded messages.

18.   (New) The method according to claim 17, further
comprising the step of:

transmitting further data in a particular data block
of the data stream, the further data including:

an identifier which indicates that the
selection data is being transmitted,

a particular number of a location list for
decoding the digitally coded messages in the at
least one of the receivers, and

particular data relating to a type of the
selection data.

19.   (New) The method according to claim 18, wherein the
selection data includes coordinates and a radius of the
respective transmission region of the at least one of the
transmitters, and further comprising the step of:

transmitting the particular data in the particular
data block using a predetermined bit, the predetermined bit
indicating whether the selection data includes one of:

the location codes of the particular areas, and

the coordinates and the radius.

20.   (New) The method according to claim 19, further
comprising the step of:

transmitting, in the particular data block, data
indicative of a particular number of the location codes to be
transmitted.

21. (New) The method according to claim 18, wherein at least one of the location codes is transmitted in at least one particular data block.

22. (New) The method according to claim 18,

wherein the selection data includes coordinates and a radius of the respective transmission region of the at least one of the transmitters, and

wherein at least one of the transmitters transmits the radius in the particular data block, and transmits the coordinates in a further data block.

23. (New) A receiver, comprising:

a device receiving selection data transmitted by transmitters, the selection data indicating a respective transmission region of at least one of the transmitters,

wherein the device selects digitally coded messages which are emitted by the transmitters as a function of the selection data which depend from a respective position of the receiver, the digitally coded messages including location data, and

wherein the device compares the selection data to the location data.

24. (New) The receiver according to claim 23,

wherein, when overlapping data of the selection data is being received by the device, the device selects the digitally coded messages as a further function of an intersection of the received selection data, and

wherein the data is transmitted by a group of the transmitters.--.

## REMARKS

This Preliminary Amendment cancels, without prejudice, claims 1-12 in the underlying PCT Application No. PCT/DE98/00473, and adds new claims 13-24. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

The amendments to the drawings, specification and
abstract are to conform the drawings, specification and
abstract to U.S. Patent and Trademark Office rules, and do not
introduce new matter into the application.

The underlying PCT Application No. PCT/DE98/00473
includes an International Search Report, dated August 10,
1998, a copy of which is included.  The Search Report includes
a list of documents that were considered by the Examiner in
the underlying PCT application.

Applicants assert that the present invention is new,
non-obvious, and useful.  Prompt consideration and allowance
of the claims are respectfully requested.

Respectfully Submitted,

KENYON & KENYON

*Richard L. Mayer*

Dated: 11/13/98    By: *Mary C. Werner*  Reg No 30,333
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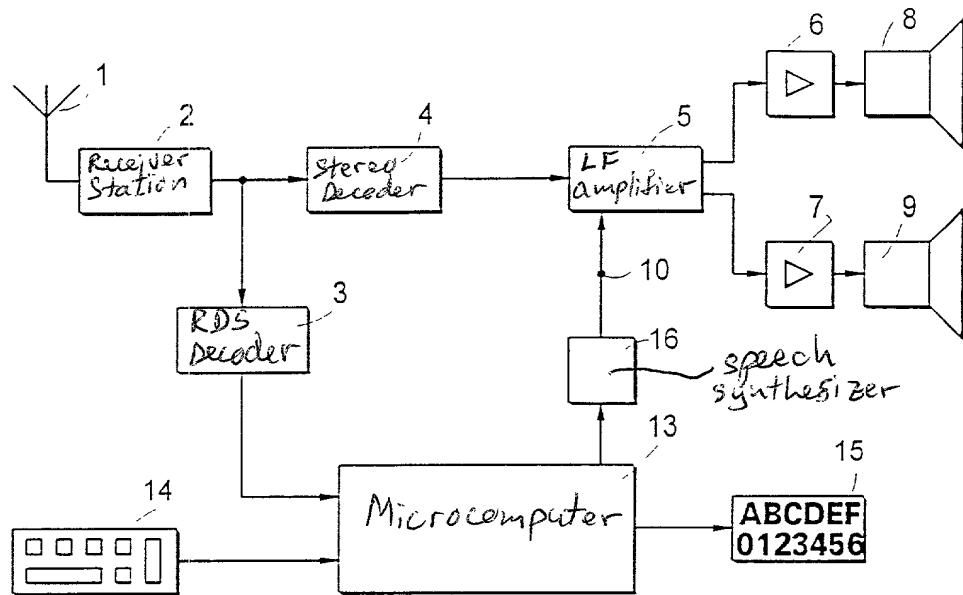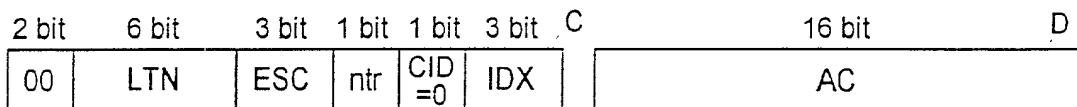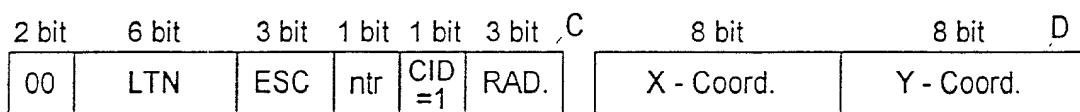
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Fig.1

| 2 bit | 6 bit | 3 bit | 1 bit | 1 bit | 3 bit | C | 16 bit | D |
|---|---|---|---|---|---|---|---|---|
| 00 | LTN | ESC | ntr | CID =0 | IDX | | AC | |

Fig.2a

| 2 bit | 6 bit | 3 bit | 1 bit | 1 bit | 3 bit | C | 8 bit | 8 bit | D |
|---|---|---|---|---|---|---|---|---|---|
| 00 | LTN | ESC | ntr | CID =1 | RAD. | | X - Coord. | Y - Coord. | |

Fig.2b

# METHOD AND RECEIVER FOR GEOGRAPHICAL SELECTION OF DIGITALLY CODED MESSAGES

The present invention concerns a method for geographical
selection of digitally coded messages which are emitted from
several transmitters and contain location data that are
compared, in receivers, to selection data that are dependent
5   on the respective position of the receivers; and a receiver
having a device for the selection of digitally coded messages.

Spoken traffic announcements for informing automobile drivers
have already been known for some time. These announcements
10  have a variety of disadvantages, for example delays and
inaccuracies which are associated with the manual and thus
also subjective reception and forwarding of the data. It may
happen, for example, that an automobile driver encounters a
traffic jam that has not (yet) been announced; or that despite
15  a traffic jam warning, the road in question can be traveled
with relatively little disruption when the driver arrives at
the point referred to.

More accurate sensing and more rapid transmission have become
20  possible with the aid of the system for transmitting digitally
coded traffic messages that has become known in the last few
years. The configuration and coding of these traffic messages,
and the location lists, are defined in CEN pr ENV12313-1 and
pr ENV/278/7/3/0004, based on the proposed ALERT C standard of
25  June 1996 issued by the RDS ATT ALERT consortium. In this
context, the essential elements of a traffic message are the
location of the event, and the event itself. These indications
are cataloged, i.e. a unique code is assigned to each
traffic-relevant location and each traffic-relevant event.
30  Concatenation of the locations in the location table along
existing roads reproduces the profile. In addition to the

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usual devices of a receiving unit having an RDS decoder, devices for decoding, storing, processing, and outputting the traffic messages are required in order to use the TMC (traffic message channel).

5

Digitally coded traffic messages, hereinafter also called TMC messages, can be transmitted using the Radio Data System (RDS), which allows additional and inaudible transmission of digital data concurrently with broadcast programs in a data channel. The specifications of the Radio Data System for FM audio radio are defined, among other places, in the document Tech. 3244 - E, March 1984, of the European Broadcast Union (EBU). Radio receivers with suitable RDS decoders can receive and decode transmitted data, in addition to audio reception, with the same receiving section.

When the TMC system is introduced, a very large number of TMC messages may be expected, only a small portion of which are of interest to each particular automobile driver. One essential quality feature of future receivers for digitally coded messages will therefore be the ability to filter out or select, from the large number of received messages, those relevant to the driver, and thus protect the driver from information overload. Position-related selection is advantageous in this context, but requires knowledge of the position of the receiver, i.e. of the vehicle.

Various methods are known for ascertaining position - if applicable, even an approximate position. For example, the position can be entered manually via area and distance codes, but on longer journeys this is too inflexible and cumbersome. Coupling the RDS/TMC receiver to a navigation system, for example GPS, requires additional technical outlay and therefore more cost.

35

It is the object of the present invention to make possible position-related selection without additional control effort, and with the minimum possible technical outlay.

5     In the method according to the present invention, this object is achieved in that the transmitters additionally emit selection data which characterize their respective transmission regions and which, in the receiver, are compared to location data contained in the messages.

10

The method according to the present invention uses only the data present in any case in the receiver for the decoding of messages. The accuracy achieved thereby is lower than in the case of a navigation system, but is nevertheless entirely adequate for the selection of messages. A change in the frequency or program information code of one or more transmitters is immaterial to the method according to the present invention, as long as the selection data emitted by the transmitter are still present.

15

20

The method can be used in particularly advantageous fashion with receivers of the type which automatically search for transmitters and tune to the strongest transmitter of a desired program based on the reception conditions. In this context, the method according to the present invention can also be used in so-called one-tuner units, since field-strength measurements on other frequencies do not need to be performed.

25

30    For units with dedicated TMC tuners, it is furthermore advantageous that when several TMC transmitters are being received, a selection of the service can also be made on the basis of the selection data, in particular the area code. For example, if the system knows the destination of the journey, it can select the TMC service whose area code contains the

35

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destination, since this ensures that all the messages relevant
to the route of travel are selected. The method furthermore
does not depend on specific RDS details, and can also be
transferred to other transmission media, for example DAB,
5      AMDS, etc.

In a first embodiment of the method according to the present
invention, provision is made for the selection data to be
location codes of areas which are defined for the coding and
10     decoding of messages and fall at least partially in the
transmission region. The location codes, hereinafter also
called area codes, can be used directly by the receiver as a
selection criterion, since all the locations defined for the
coding and decoding of messages are referenced to such
15     location codes. In other words, the only messages which pass
through the filter are those whose primary or secondary
location indication is located inside the territory defined by
the area code.

20     A second embodiment of the method according to the present
invention consists in the fact that the selection data are
coordinates and radii of the transmission regions. In this
context, the radius represents, in simplifying fashion, the
range of the respective transmitter. In order to use these
25     selection data in the receiver, the location coordinates for
each location code must also be stored in the location list.
Since this is also a prerequisite for a graphic depiction of
the traffic situation, such data are often already contained
in the location list, and can additionally be used for the
30     method according to the present invention.

Especially in the case of transmitters with long ranges, the
second embodiment is, if applicable, more favorable, since the
propagation area could be described either inaccurately by
35     indicating a large area (a state or province), or accurately

4

using many small areas. Since each code requires 16 bits of
transmission capacity, the decision in terms of definition at
the transmitter end is then often made in favor of the
inaccurate solution.

5

Accuracy is greatest if the respective selection data
applicable to each individual transmitter are emitted before
it. In accordance with a further embodiment of the method
according to the present invention, however, it is also

10      possible for a group of transmitters to emit identical
selection data in each case.

A development of the method according to the present invention
consists in the fact that the selection data and reference

15      data for the selection data are transmitted in system messages
of a data stream containing the digitally coded messages. The
TMC signal as defined by ALERTC, in particular, contains in
each case four system messages which are differentiated via
the respective first two bits of block C. In this development,

20      the first of these variants with the code 00 can be used for
transmission of the selection data. In this context, provision
is preferably made for the following data to be transmitted in
a first data block: an identifier indicating that selection
data are being transmitted, the number of a location list

25      necessary for decoding the messages in the receiver, and data
concerning the type of selection data.

Lastly, if it is to be possible both to transmit area codes
and to transmit coordinates and radii, in an advantageous

30      embodiment of this development provision is made for
additionally transmitting in the first data block the
information concerning the type of selection data, by way of a
bit which states whether the selection data consist of
location codes of areas, or coordinates and radii. In the case

35      where area codes are transmitted, it is advantageous

additionally to transmit in the first data block an indication of how many location codes of areas are to follow. In this context, a location code of an area can be transmitted in at least one further data block.

5

For a selection datum consisting of radius and coordinates, the development of the method according to the present invention can be embodied in such a way that the radius is transmitted in the first data block, and the coordinates in a

10 further data block.

In a receiver according to the present invention having a device for the selection of digitally coded messages which are emitted by several transmitters, contain location data, and

15 are selected in the receiver on the basis of selection data that depend on the respective position of the receiver, the object of the present invention is achieved in that the receiver furthermore has a device for the reception of selection data which are emitted by transmitters and which

20 characterize the transmission region of the respective transmitter, and a device for comparing the selection data to the location data contained in the messages.

In accordance with a development of the receiver according to

25 the present invention, the size of the selection area can be reduced by the fact that when several transmitters with overlapping selection data are being received, the intersection of the received selection data is used for selection.

30

Brief Description of the Drawings

Exemplary embodiments of the invention are depicted in the drawings with reference to several Figures, and are explained

35 in more detail in the description which follows. In the

6

drawings:

Figure 1   shows a block diagram of the receiver according to
the present invention;

5

Figure 2   shows a schematic depiction of data blocks which
contain selection data;

Figure 3   shows a schematic depiction of a vehicle's journey
10      through several transmission regions and TMC regions;

Figure 4   shows a flow chart for analyzing received selection
data; and

15      Figure 5   shows a flow chart for selecting messages based on
received selection data.

Detailed Description

20      The receiver depicted in Figure 1 has, in a manner known per
se, an antenna 1, a receiver section 2, a stereo decoder 4, a
LF amplifier 5, as well as power amplifiers 6, 7 and speakers
8, 9. The stereo multiplex signal delivered by receiver
section 2 is conveyed both to stereo decoder 4 and to an RDS
25      decoder 3 whose output is connected to a microcomputer 13.
Microcomputer 13 serves to control the receiver, and also to
decode and manage the TMC messages and prepare them for
reproduction and selection. A keypad 14 and a display 15 are
connected to microcomputer 13. Output of the selected TMC
30      messages can be accomplished either via display 15 or as voice
output, for which purpose microcomputer 13 is connected via a
speech synthesizer 16 to an input 10 of LF amplifier 5.

Figures 2a and 2b each show system messages made up of two
35      blocks C and D in accordance with TMC specifications, in which

7

the first two bits are set to 00; in the exemplary embodiment, this is intended to signify that these system messages are being used for the transmission of selection data. Thirty bits are initially available for this purpose in block C. The six

5    bits adjacent to 00 represent a location table number LTN, since according to TMC specifications a number of location lists are possible, and the method according to the present invention takes that into account.

10   There follow three bits as extended service characteristics (ESC), which allow a more accurate description of the service, e.g. specific operating states or a description of the message contents. If one or more messages are currently being sent out, the following bit (ntr = nothing to report) is set to 0,

15   while a 1 indicates that no messages about problems are present. The next bit defines the type of selection data: a 0 means that the following 19 bits contain an index and an area code. A 1 indicates that the following 19 bits contain geographical coordinates and a radius. Lastly, a three-bit IDX

20   is provided, identifying how many of the up to eight different area codes are being transmitted.

The following 16-bit data block D transmits an area code, i.e. the location code of an area located in the location list

25   cited in LTN.

If the selection data are being transmitted in the form of geographical coordinates and range, then as shown in Figure 2b the CID (= coordinate ID) bit is set to 1. The IDX bits are

30   then used to transmit the radius, for example in 30-km steps from 000 = 30 km to 111 = 240 km. The second data block D transmits the X and Y coordinates, using eight bits each. The area covered by the location list is thus subdivided into 256 x 256 fields. These can then be addressed individually via the

35   X and Y coordinates.

8

Figure 3 schematically shows the journey of a vehicle from a point A to a point B. In the process, the vehicle comes into range of transmitters x, y, and z, thereby traveling through areas G1 through G7. After beginning the journey, the vehicle first enters the transmission region of transmitter x. Its transmission region is covered by areas G1 through G6, so that all the messages from this area are selected. At point B, the receiver switches over to transmitter y which can now be received better. The latter indicates areas G2, G3, G5, and G6 as its transmission regions. By comparison with the areas of transmitter x (which can still be received), the receiver can now narrow down the selection to areas G2 and G3, and outputs messages only for those regions.

At point C the vehicle leaves the region of transmitter y, but can now pick up transmitter z. Although the latter can be received more weakly than transmitter x, the receiver selects that transmitter because destination E is located in area 7, and only transmitter z references that area. Thereafter, the selection takes into account only messages from areas G3 and G4, which corresponds to the intersection of the areas indicated by transmitters x and z. From point D on, messages from the destination area are also selected, since now transmitter x can no longer be received, and the creation of an intersection is superfluous.

Figure 4 shows a flow chart for the analysis of received selection data, which hereinafter will also be called selection codes. After starting at 21, in program section 22 an 8A group is fetched from the communication unit and decoded. At 23, execution branches depending on whether a group of selection codes SC is involved. If not, i.e. if the message is a standard TMC message, it is decoded at 24 and at 25 is selected based on the particular selection table currently in memory. This selection table was created by way

of previously received selection codes.

A determination is then made at 26 as to whether further 8A
groups are present. If not, the program terminates at 27.

5

If 8A groups are still present, however, then in program
section 22 an 8A group is fetched from the communication unit
and decoded, and then once again checked at 23 to determine
whether it is a group of selection codes SC. If so, a

10    determination is made at 28 as to whether the CID bit (Figure
2) is set to 0 or to 1. If the CID bit equals 0, the selection
codes contain location codes with which (at 29) the selection
table is updated. If CID equals 1, coordinates are being
received as selection codes in the same 8A group, so that (at

15    31) the selection table is updated with the received
coordinates.

After 29 or 31, the program branches at 32 depending on
whether the message count M equals zero. If not, i.e. if

20    messages are still present in memory, selection is performed
at 25 using the updated selection table. If no further
messages are present, execution branches to 26.

Figure 5 shows a flow chart for the selection of messages

25    based on received selection codes. After starting at 41, an
error-corrected and verified 8A group is called at 42. The
program then branches at 43, depending on whether or not a
selection is active, i.e. whether a user has set a selection.
If not, the message - like every other one - is marked as

30    selected (at 44). The program then terminates at 45. If,
however, the selection is active at the branching point 43, a
determination is made at 46 as to whether the selection table
contains coordinates. If not, a determination is then made at
47 as to whether the selection contains area codes AC. If so,

35    a determination is made at 48 as to whether the location code

10

LC contained in the respective processed message is referenced to area codes AC. If so, at 44 the message is marked as selected. If not, at 49 the message is marked as not selected.

If it is ascertained at 46 that the selection table contains coordinates, then at 50 the coordinates COORD belonging to the respective location code are identified. The program then branches at 51, depending on whether location L is located outside the area A defined by the coordinates contained in the selection table. If the location is not outside that area, the program continues at 47. If, however, the location is outside the area, then at 49 the message is marked as not selected.

Claims

1. A method for geographical selection of digitally coded messages which are emitted from several transmitters and contain location data that are compared, in receivers, to selection data that are dependent on the respective position of the receivers, wherein the transmitters additionally emit selection data which characterize their respective transmission regions and which, in the receiver, are compared to location data contained in the messages.

2. The method as defined in Claim 1, wherein the selection data are location codes of areas which are defined for the coding and decoding of messages and fall at least partially in the transmission region.

3. The method as defined in Claim 1, wherein the selection data are coordinates and radii of the transmission regions.

4. The method as defined in one of the foregoing claims, wherein identical selection data are emitted in each case by a group of transmitters.

5. The method as defined in one of the foregoing claims, wherein the selection data and reference data for the selection data are transmitted in system messages of a data stream containing the digitally coded messages.

6. The method as defined in Claim 5, wherein the following data are transmitted in a first data block: an identifier indicating that selection data are being transmitted, the number of a location list necessary for decoding the messages in the receiver, and data concerning the type of selection data.

12

7.    The method as defined in Claim 6, wherein the information concerning the type of selection data is additionally transmitted in the first data block, by way of a bit which states whether the selection data consist of location codes of areas, or coordinates and radii.

8.    The method as defined in Claim 7, wherein an indication of how many location codes of areas are to follow is additionally transmitted in the first data block.

9.    The method as defined in one of Claims 6 through 8, wherein a location code of an area is transmitted in at least one further data block.

10.    The method as defined in one of Claims 6 through 8, wherein the radius is transmitted in the first data block, and the coordinates in a further data block.

11.    A receiver having a device for the selection of digitally coded messages which are emitted by several transmitters, contain location data, and are selected in the receiver on the basis of selection data that depend on the respective position of the receiver, wherein the receiver furthermore has a device for the reception of selection data which are emitted by transmitters and which characterize the transmission region of the respective transmitter, and a device for comparing the selection data to the location data contained in the messages.

12.    The receiver as defined in Claim 11, wherein when several transmitters with overlapping selection data are being received, the intersection of the received selection data is used for selection.

Abstract

In a method and a receiver for geographical selection of
digitally coded messages which are emitted from several
transmitters and contain location data that are compared, in
receivers, to selection data that are dependent on the
respective position of the receivers, provision is made for
the transmitters additionally to emit selection data which
characterize their respective transmission regions and which,
in the receiver, are compared to location data contained in
the messages.

38563-1

14

1/4



Fig.1

| 2 bit | 6 bit | 3 bit | 1 bit | 1 bit | 3 bit | C | 16 bit | D |
|---|---|---|---|---|---|---|---|---|
| 00 | LTN | ESC | ntr | CID =0 | IDX | | AC | |

Fig.2a

| 2 bit | 6 bit | 3 bit | 1 bit | 1 bit | 3 bit | C | 8 bit | 8 bit | D |
|---|---|---|---|---|---|---|---|---|---|
| 00 | LTN | ESC | ntr | CID =1 | RAD. | | X - Coord. | Y - Coord. | |

Fig.2b

Fig.3

3/4



Fig.4

4/4

Start ⟶ 41

8A ⟶ 42

SEL ? ⟶ 43 N

Y

COORD ? ⟶ 46 N

Y

COORD (LC) ⟶ 50

L Ⓐ ? ⟶ 51 N

AC ? ⟶ 47 N

Y

Y

L ref. AC ? ⟶ 48 N

Y

M SEL ⟶ 49

M SEL ⟶ 44

End ⟶ 45
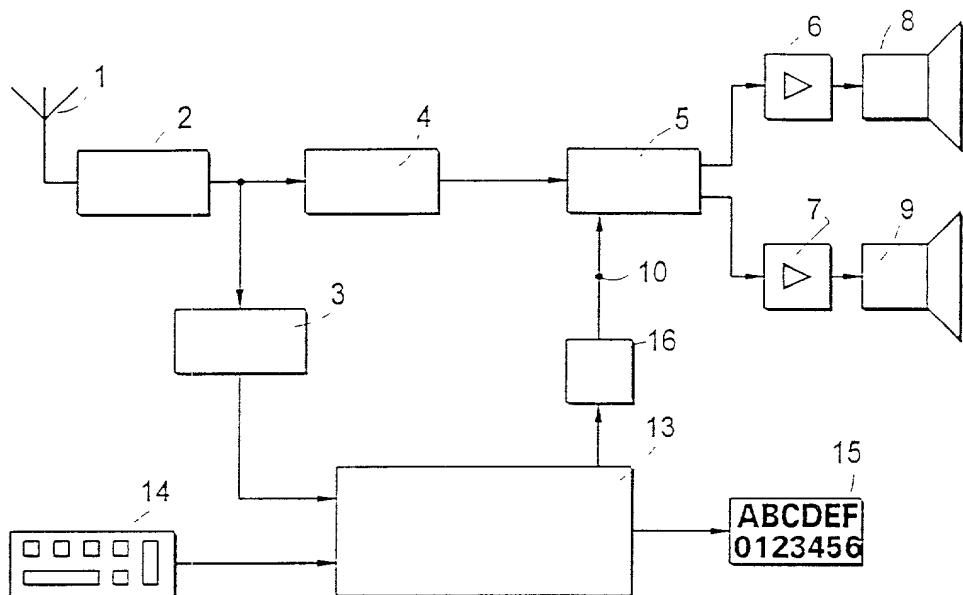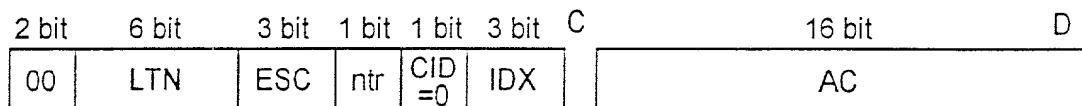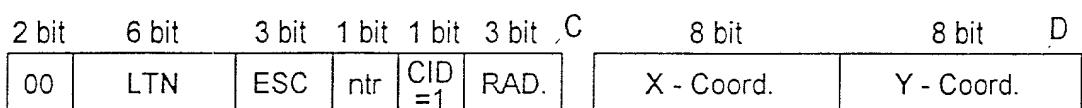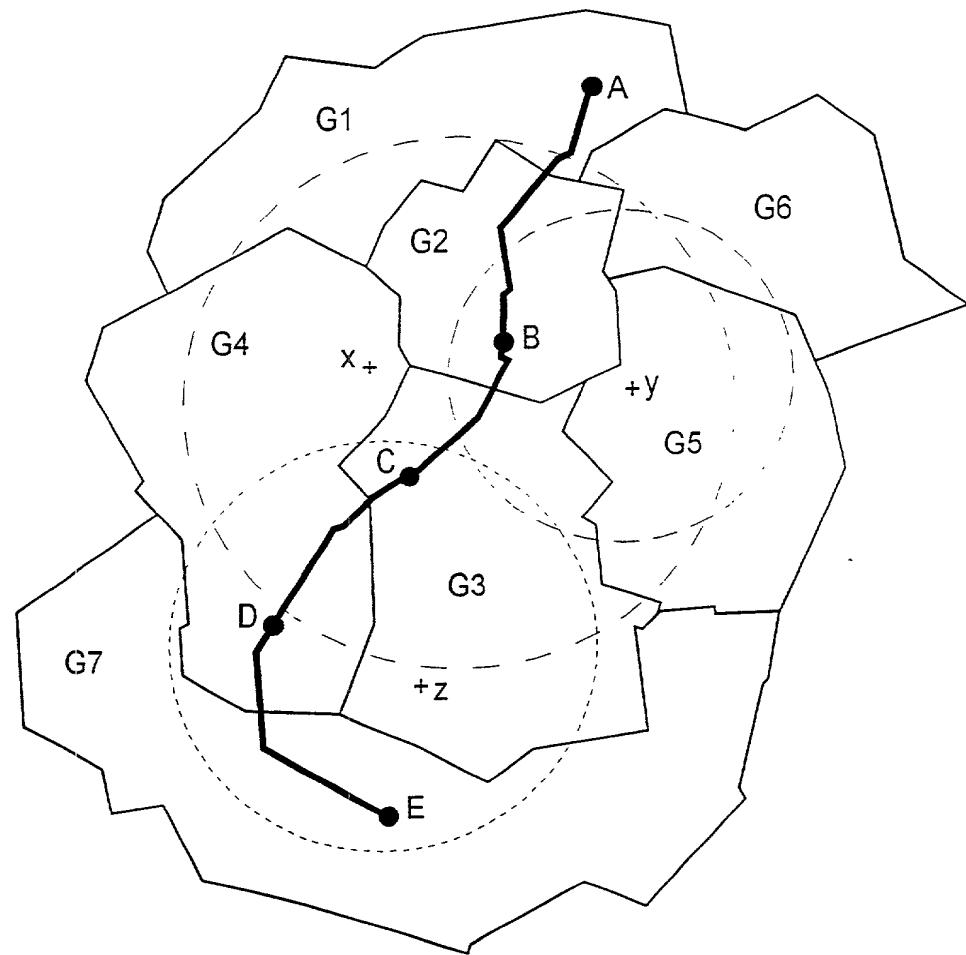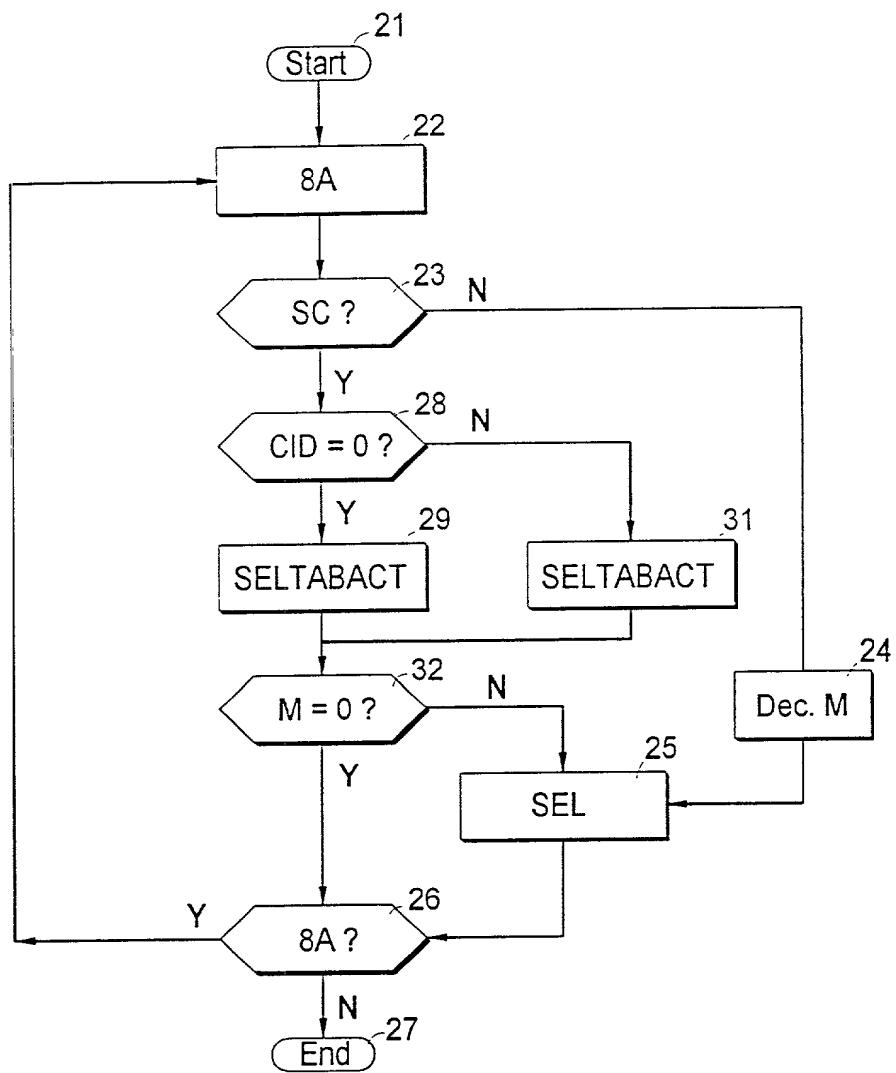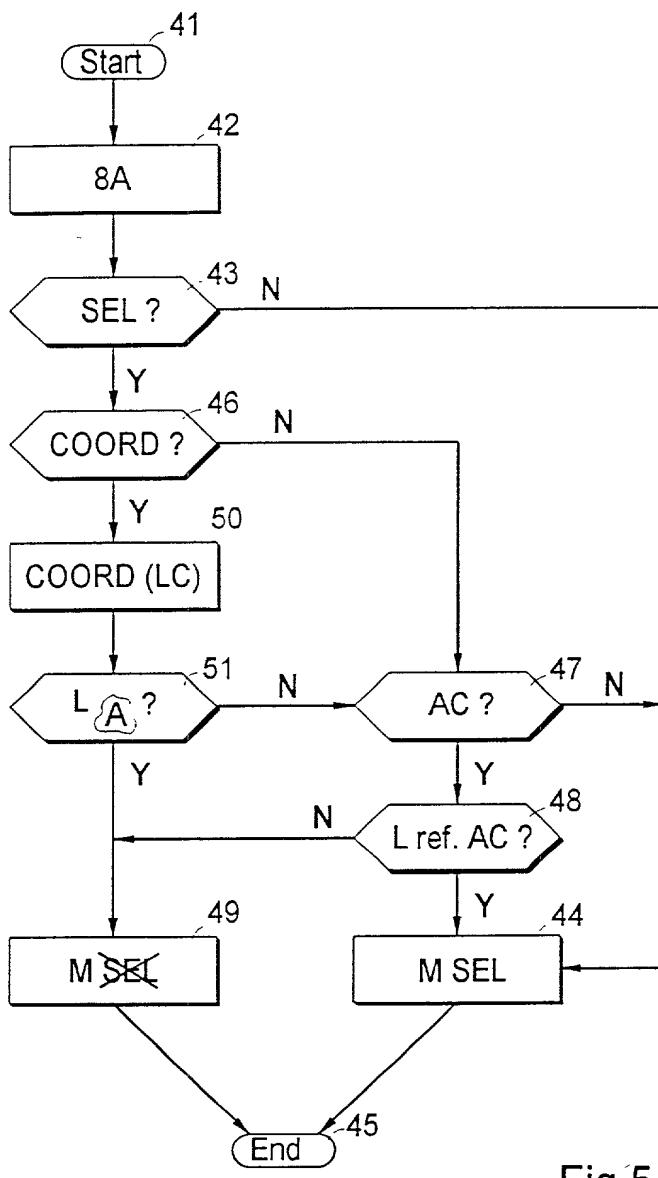
Fig.5

## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHOD AND RECEIVER FOR GEOGRAPHICAL SELECTION OF DIGITALLY CODED MESSAGES**, the specification of which was filed as International Application No. PCT/DE98/00473 on February 18, 1998.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

### PRIOR FOREIGN APPLICATION(S)

| Number | Country filed | Day/month/year | Priority Claimed Under 35 USC 119 |
|---|---|---|---|
| 197 10 863.6 | Fed. Rep. of Germany | 15 March 1997 | Yes |

EL179956735905

And I hereby appoint Richard L. Mayer (Reg. No. 22,490) and Gerard A. Messina (Reg. No. 35,952) my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful and false statements may jeopardize the validity of the application or any patent issued thereon.

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38631